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with the three subdivisions indicated. This conclusion depends upon the view that the structure of the ovulate cone, especially its vascular structure, is the paramount feature in determining relationship. An interesting incidental suggestion (following BERTRAND) is that the aril of *Saxegothaea* is the equivalent of the ligule of *Araucaria* and the ovuliferous scale of other conifers.—J. M. C.

A primitive lichen.—*Botrydina vulgaris*, regarded in general as a problematical green alga, has now been investigated by Miss ACTON.³² It occurs as dark green, globular structures, which in the material examined were covering the shoots of a moss and a liverwort. Each one of these structures proved to consist of a central group of algal cells imbedded in mucilage, which in turn was traversed by investing fungal hyphae that formed also a colorless envelope of considerable thickness. The cultures showed that both the alga and the fungus are "able to develop quite well apart, and multiplication of *Botrydina* is probably due to this." Since this structure consists of an alga and a fungus growing symbiotically, the conclusion is that it should be regarded as a lichen, and that it is "possibly one of the most primitive of existing lichens." The alga and the fungus were both determined, and the habitat is said to be "in damp shady situations among various bryophytes, generally on rocks, but sometimes on damp ground."—J. M. C.

Movements of *Myriophyllum* leaves.—WÄCHTER has recorded³³ some interesting phenomena regarding the young leaves of *Myriophyllum proserpinacoides*. The leaves of both the land and water form of this plant have already been known to execute so-called sleep movements, so long as they are capable of growth; and such movements would be very properly called photonastic.³⁴ In studying these movements WÄCHTER has discovered that leaves which had almost or quite ceased to respond to light would resume these curvatures if the shoot were decapitated. This seems to be a phenomenon analogous to the reactivation of growth in the nodes of grasses under a gravity stimulus, and still more like the reaction of certain conifers to decapitation, though different in details from either. It has also relations to the excitation of growth by a wound stimulus, and compensative growth such as that in *Streptocarpus* when the big cotyledon is removed or incased in plaster and the small one resumes its development.—C. R. B.

The mycorrhiza of *Cordaites*.—*Amyelon radicans* is a root of the Coal Measures, which has been shown to belong to *Cordaites*. It bears such remarkable and irregularly arranged bunches of lateral roots, that OSBORN³⁵ has examined

³² ACTON, ELIZABETH, *Botrydina vulgaris* Brebisson, a primitive lichen. *Annals of Botany* 23:579-585. *pl.* 44. 1909.

³³ WÄCHTER, W., Beobachtungen über die Bewegungen der Blätter von *Myriophyllum proserpinacoides*. *Jahrb. Wiss. Bot.* 46:418-442. *figs.* 2. 1909.

³⁴ Cf. *BOT. GAZETTE* 48:313. 1909.

³⁵ OSBORN, T. G. B., The lateral roots of *Amyelon radicans* Will., and their mycorrhiza. *Annals of Botany* 23:603-611. *pls.* 46, 47. 1909.